

Fluvial Geomorphology:

A Foundation for Watershed Protection, Management, and Restoration in Northwest Indiana

The principles and applied methods of fluvial geomorphology can be used to:

1. **Assess stream channel stability** and understand the evolution of channel adjustments in response to anthropogenic and external forces.
2. **Describe the complex scales of cause and effect** and the implications for lake and stream impacts created by watershed land use.
3. **Assure that infrastructure maintain or improve channel stability** while minimizing maintenance costs.
4. **Predict the sensitivity of water bodies** to any watershed change.

Fluvial geomorphology is a scientific discipline, which seeks to explain the physical interrelationships of flowing water and sediment in varying landforms.

A Watershed Management Perspective

Fluvial geomorphology is an essential tool and organizing principle for community-based watershed management, protection, restoration, and education.

The science-based foundation can technically support Lake Michigan watershed's resource initiatives.

By focusing on watersheds as a whole, hydrologic system responses can be predicted in virtually any location.

Public support and policy can be influenced by measurable field data that assesses resource quality as well as ecological and economic potential.





The Fluvial Geomorphology Toolbox

Understanding What Data to Collect

Along with water quality and hydrology sampling data, fluvial geomorphology requires a few elements to collect, in order to create and implement a more well-rounded watershed management plan.

- **Stream Classification:** to understand current stream condition and potential behavior under the influence of different types of changes (Figure 1).
- **Slope:** a major determinant of river channel morphology, and the related sediment, hydraulic, and biological functions.
- **Substrate Composition:** identify the abundance of each different material (Figure 2)

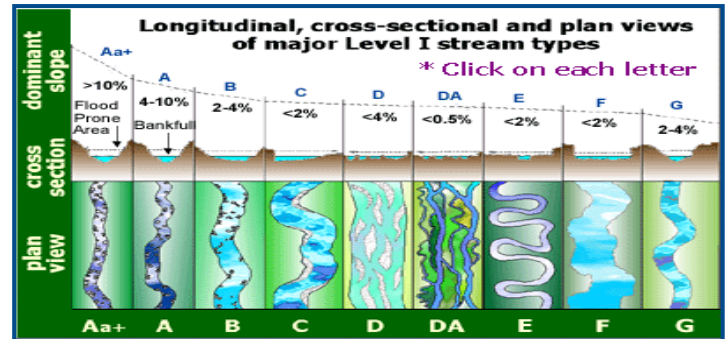


Figure 1: Rosgen's Stream Classification, 1996.

Phi Units*	Size	Wentworth Size Class	Sediment/Rock Name
-8	256 mm	Boulders	Sediment: GRAVEL Rock: RUDITES: (conglomerates, breccias)
-6	64 mm	Cobbles	
-2	4 mm	Pebbles	
-1	2 mm	Granules	
0	1 mm	Very Coarse Sand	Sediment: SAND Rocks: SANDSTONES (arenites, wackes)
1	1/2 mm	Coarse Sand	
2	1/4 mm	Medium Sand	
3	1/8 mm	Fine Sand	
4	1/16 mm	Very Fine Sand	Sediment: MUD Rocks: LUTITES (mudrocks)
8	1/256 mm	Silt	
		Clay	

* Udden-Wentworth Scale

Figure 2: Wentworth Substrate Scale.

For More Information...

Consult the following:

[EPA's Watershed Academy](#)

[USGS Surface Water Information](#)

[Indiana's Lake Michigan Coastal Program](#)

